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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • JULY 29, 1944

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A SCIENCE SERVICE PUBLICATION

AERONAUTICS

Bombsight Announced

Especially valuable for night operations and low-altitude bombing, the T-1 bombsight permits accurate hits while plane is maneuvered.

➤ FACTS ABOUT the T-1 bombsight designated by the British as the Mark XIV, until now one of the major military secrets of the war, have been released by the War Department and the British Air Ministry. This bombsight is a mechanical combination of a mathematician and a Kentucky long-rifle marksman, especially valuable for night operations and low-altitude bombing, since it permits accurate bombing while the plane is being maneuvered.

The bombsight consists of two units, the computer and the sighting head. The bombardier uses the sighting head, containing an optical telescopic mechanism, to find his target, and when the cross hairs in the sighting head line up with the target the bombs are released. All variables, wind velocity, wind direction, wind characteristics, and target height above ground, are instantaneously made by the computer and transmitted to the sighting head.

The T-1 bombsight, conceived by a group of English scientists before Pearl Harbor, is being manufactured in large quantities by AC Spark Plug division of General Motors, since manufacturing facilities were not sufficient for its production in England. It is being produced under joint supervision of British and American experts for use on the British Wellington bombers, as well as other British planes. The improvement and production of the T-1 in this country is a fine example of British and American scientific and industrial cooperation.

The American-built sight weighs 55 pounds and is made up of 4,212 pieces. A total of 1,589 drawings is required for its production. The bombsight's moving parts are operated by high air pressure and vacuum developed by special pumps connected to the plane's fuel system.

Like all other bombsights, the T-1 determines the correct point in space at which a specific type of bomb must be released to strike a selected target. As the plane nears the target, the bombardier sets the sight in operation. Then he feeds information into the mechanical mind of the bombsight.

The first information given the machine is height or altitude. The T-1 can be used accurately up to nearly four miles above sea level. Then comes air speed, followed by wind speed, wind direction, altitude of the plane. A gyroscope determines pitch and roll of the plane.

The bombardier directs the pilot of the bomber on how to steer the plane. Looking into the telescopic sighting head, with one eye the bombardier sees by means of the telescope the target on the ground, with the other eye he sees two lines of light forming the cross-hairs. When the cross-hairs appear to be on the target, the bombardier releases his bombs.

The T-1 bombsight permits the bombing plane to be flown in any manner—up, down, turn to the right or left, fast or slow. The T-1 has not been adopted to the exclusion of other sights, because it answers only one of many bombing problems, and like the other bombsights it has its own particular use and limitations.

Before being shipped to the Royal Air Forces, the T-1 bombsights are given exhaustive tests at the AC Spark Plug plant. One little error would nullify the bombardier's finest calibrations. One of these tests simulates actual altitude conditions from sea level to 23,000 feet above. The bombsight must withstand all temperatures between 60 degrees Fahrenheit below zero and 160 degrees Fahrenheit above.

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MEDICINE

New Treatment Developed For "March Fractures"

➤ THE FAMOUS "What Do You Do In The Infantry" song might as a result of this war get a new middle line, "You break your metatarsal bones and get a special shoe," it appears from an announcement from the Office of the Surgeon General of the Army released by the War Department.

BRITISH BOMBSIGHT, made in America, consists of computer device (left) which automatically makes all calculations necessary for accurate, precision bombing, then transmits this information to the sighting head (right) through which the bombardier peers to see the target. Designated the Mark XIV, it is used on Royal Air Force planes.

Fractures of the metatarsals and other bones of feet and legs, known medically as "march fractures" because they result apparently from prolonged marches, have been plaguing Army doctors since infantry training courses have been "toughened up." Several hundred cases have been included in formal reports of medical officers and it is estimated there is generally a high range of occurrence in the Army.

A new treatment for the condition when it affects the bones of the forward part of the arch of the foot has been developed by orthopedic surgeons at Camp Wolters, Texas. Instead of ordering the man to bed, these surgeons keep him on duty but build a thin, flat iron bar into the non-weight-bearing part of the sole of his shoe. Sometimes a felt or rubber pad is added to this "march bar." Because the bone is protected from strain, healing is rapid and many man-hours of training time are saved.

"March fractures" have long been a military medical problem, although not until the development of X-rays were they recognized as fractures. Even with X-rays, it is difficult to diagnose the condition because the broken bones are not displaced and the crack may not show.

The accepted theory is that these fractures occur when over-exertion produces extreme fatigue and complete exhaustion of the muscles, thus throwing all the stress directly on the bones. It occurs in otherwise healthy individuals of all ages and physical conditions. The bone is not broken by any heavy blow or specific injury or strain.

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ENTOMOLOGY

Gipsy Moth Wiped Out

D.D.T., used by the Army in combatting mosquitoes and typhus-carrying lice, has added another conquest to its string of triumphs.

➤ D.D.T., the deadly new insecticide used by the Army in combatting mosquitoes and ridding liberated populations of typhus-carrying lice, has added a new conquest to its string of triumphs over man's winged and many-legged foes. This time it is the gipsy-moth caterpillar, forest-stripping pest introduced many years ago from Europe and now one of the most devastating enemies of Eastern timbered areas. The Pennsylvania State Department of Agriculture tells of a spectacularly successful experimental attack on the gipsy-moth caterpillars on a 20-acre woodland tract near Scranton.

On May 3, a solution of D.D.T. was sprayed over the tract by airplane. Five pounds of the chemical was used per acre. Within the following week practically all of the gipsy-moth eggs in the area had hatched—and not one caterpillar survived. And this, despite the fact that there had been two rains over the treated area.

For good measure, the D.D.T. had also killed off all the mosquitoes and blood-sucking black flies in the test plot, as well as all leaf-feeding insects besides the gipsy-moth caterpillars. Yet birds have been observed in the test plot, and cattle grazing across the road from the timber tract have shown no signs of harm.

Shortly after mid-May, C. F. Campbell, senior entomologist in charge of gipsy-moth control work for Pennsylvania, offered a dollar apiece, out of his own pocket, for any gipsy-moth caterpillars found in the treated area. To date he has had no takers.

Since all D.D.T. now manufactured, except small lots assigned for experimental purposes, is being used by the armed forces, large-scale application of the insecticide to pest control cannot be made until after the war.

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STATISTICS

Diabetes Will Outrank T. B. as Cause of Death

➤ STARTING about the year 1950, diabetes will begin to outrank tuberculosis as a cause of death in this country, statisticians of the Metropolitan Life Insurance Company calculate.

Even though deaths from diabetes are progressively increasing, while those from tuberculosis decline, the outlook for a normal lifespan for diabetics is now better than ever.

The growing proportion of older people in the population plus the improvement in the fight against infectious diseases explains the change in rank as killers of diabetes and tuberculosis. In 1909, the statisticians recall, tuberculosis was the leading cause of death in this country, with diabetes ranking sixteenth. Now tuberculosis ranks seventh and diabetes ninth.

The increased longevity of persons with diabetes is the result of modern treatment of the disease. Thousands of diabetics in every walk of life are "contributing notably to the war effort," the statisticians report.

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BOTANY

Botanical Clue

Evidence has been produced indicating Roger Bacon could not have written the Voynich manuscript. Composed in cipher, it has never been read.

➤ BOTANICAL evidence has been produced against the supposed authorship of the Voynich manuscript, one of the most famous unsolved ciphers in the world. At least two of the plants depicted in its illustrations were unknown in Europe until after Columbus' return from the New World in 1493; and the supposed author, the famous scientist-monk Roger Bacon, died in 1294, almost an even two centuries before that date.

This piece of evidence, which appears to get at least one end of a bracket on the date of the much-debated but never-read document, has been turned up by Prof. Hugh O'Neill, botanist at the Catholic University of America in Washington.

The Voynich manuscript, so called after its most recent owner, a well-to-do and scholarly Philadelphia business man, lately deceased, first turned up in European learned circles in early modern times. Kings and great nobles vied for its possession. Students and cryptographers racked their brains trying to read it, but no one ever succeeded. The manuscript consists of about 120 pages bound in book form. The hand-written text is in a fine, clear, vertical script that at first glance looks as if it might be a modified Latin or Greek—but any amount of the closest scrutiny still leaves it maddeningly meaningless.

How the legend grew that its author was Roger Bacon nobody seems to know now; but that is the repute which the mysterious manuscript has carried for several centuries.

There are many drawings on the pages, a considerable proportion of them being pictures of plants. It occurred to Prof. O'Neill that these might furnish some clue to the origin of the manuscript.

Most of the drawings are more or less stylized, after the fashion of such art in late medieval and early modern times, and many of the plants cannot be identified. Most of those to which Prof. O'Neill was able to give names proved to be native to Europe. However, he found two that seem to be definitely American—though even these would hardly be accepted as illustrations for a modern textbook of botany.

One of these appears to be a picture of a sunflower. Not wishing to rely on his own judgment entirely, Prof. O'Neill submitted the picture to six other botanists, and they all agreed it was meant to be a sunflower. The other, a smaller sketch, shows the pointed pods of a plant that looks like nothing European but does have a strong resemblance to capsicum or red pepper.

It is definitely known that the first sunflower seeds were carried to Europe by Columbus in 1493. Capsicum came either then or shortly thereafter. But neither plant could have been known to Roger Bacon.

Prof. O'Neill concludes: "Inasmuch as the pages of the manuscript on which these drawings appear have the drawings and accompanying text in a handwriting not obviously different than the other pages it seems necessary to consider this manuscript as having been written after 1493."

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ORDNANCE

Light Artillery May Have New Recoil Apparatus

➤ THE GOVERNMENT acquires royalty-free rights to patent 2,352,233, issued to William Summerbell of Washington, D. C., and Richard H. Mason of Havre de Grace, Md., on a recoil-absorbing apparatus especially adapted for use on small-caliber automatic anti-aircraft cannon.

The barrel of the gun is surrounded, near the breech, with a helical spring that takes up most of the backward thrust of the recoil, and also serves to check the return motion into firing position. There is, in addition, a buffer cylinder beneath the barrel which absorbs much of the jar.

The inventors state that their gun has a relatively short motion in recoil, with a correspondingly enhanced rate of fire.

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***LABORATORY TOOLS**—Sturdy funnels and graduates, seen in this Celanese Celluloid Corporation photograph, are light in weight, transparent, non-shatterable, and resistant to body and food acids. The Lumarith plastic is easy to clean; the names and quantity markings are part of the mold and will not rub or chip off at any time.*

ORDNANCE

Propaganda Weapons

Death rays and invisible noiseless bombers, claimed by the Nazis, will probably never materialize. Rocket shells and towed air-mines are real, however.

➤ NONE OF the weapons or planes which the Nazis are using for defensive or offensive warfare are secret. Claimed devices, such as death rays, bacteria, and invisible noiseless bombers, will probably never materialize. These statements are made on the basis of the Nazis' own declarations (*The Aeroplane*, June 16).

Of the weapons which the Nazis do have, the most widely used is the rocket shell. Other weapons include towed air-mines and a jet-propelled radio-controlled winged bomb.

According to the latest information, the Nazis are using two types of rocket-shells. The small ones are carried in pairs under the wings of single-seated fighter planes. The diameter of the head of the small rocket-shell is about 2.5 inches. Larger rocket shells, with the diameter of the head being around six inches, are fired from twin-motor fighter bombers. They are similar to the rocket projectiles being used by the Royal Air Force and the U. S. Navy. A salvo of eight rocket-shells from an Allied plane is equal to the broadside of a light cruiser.

The rocket shells were developed around 1929 by the late Max Valier, according to specifications released by the German Junkers Aircraft Works. The original designs were perfected by a group of research workers under the direction of Prof. Georg Madelung, one-time designer of military aircraft for the Junkers firm.

German fighters jockeying into position to fire their rocket shells are easy targets for speedy, heavily armed U. S. fighter planes, the article states.

The Nazi towed air-mines are, in reality, finned bombs weighing up to 500 pounds and towed at 1,000 feet or more behind twin-motored aircraft. As soon as they reach the target, the bomb is fired electrically. They were designed to blow up slow-moving heavy bombers sent by the Allies to raid Germany. Today, however, the Nazi planes towing air-mines are an easy target for fast-moving Lightnings, Thunderbolts, and Mustangs which are now carrying the Allied war over Germany.

The German radio-controlled winged bomb was originally designed and used against Allied convoys at Salerno. In appearance it resembles the jet-propelled pilotless planes being sent against England. The fuselage formed by the bomb is about 20 feet long, and the wingspan is about 12 feet. The weight of the bomb exceeds one ton in some instances.

The bomb casing houses a radio control unit. A rocket or jet-propulsion device is attached underneath the bomb to give initial forward speed or to increase the final velocity. The bombs are carried in pairs by heavy German fighter-bombers and are released from altitudes as high as 5,000 feet. After release, the speed of the rocket may approach 350 miles an hour. The fuse in the bomb may be detonated by radio impulse from the parent plane, which must fly a parallel course with the bomb, after release, right up to the target, exposing itself to anti-aircraft fire.

The British article states that the radio-controlled winged bomb was designed by Prof. H. Wagner, who is also assumed to be responsible for a similar armor-piercing bomb which the Nazis probably used for the sinking of the Italian battleship Roma. Wagner's winged bombs are poor weapons from the military standpoint, because they are good targets for anti-aircraft fire during the flight, *The Aeroplane* declares.

A fundamental reason, the journal continues, for introducing imaginary and real weapons that are poor from a military standpoint is to camouflage the plight of the German armed forces, and especially that of the Luftwaffe.

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CARTOGRAPHY

Rubber Contour Maps Used To Instruct Landing Forces

➤ COLLAPSIBLE rubber contour maps of enemy coastlines are being used successfully to give American landing forces accurate, well-developed knowledge of their coming battleground. When not in use, the light-weight maps can be folded or rolled into small packets for easy carriage.

Rubber models of Salerno, indicating enemy gun emplacements and pillboxes as well as natural landmarks, were used to give Gen. Mark E. Clark's army of invasion a graphic picture of what to expect, where the enemy was most likely to be concealed, and where they themselves could fox-hole with the greatest safety.

The original models are based upon aerial photographs and information from all possible sources. From these data, the model is built at the Navy's Amphibious Division, Norfolk Base, Va., showing the coastline rising to mountains, with all existing buildings and construction as well as natural landmarks.

From the original model, a plaster negative is cast. On this negative model natural rubber latex is sprayed and dried, according to a method developed by the United States Rubber Company. After reinforcements are inserted, to prevent the thin layer of rubber from collapsing in its mountainous areas, the model is cured, stripped from the mold, painted to simulate the actual landscape, and the completed map is ready for study by invasion forces right up to the time of the landing.

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AGROSTOLOGY

Buffalo Grass Now Holds Soil Under Plane Tires

➤ BUFFALO GRASS, the tough, curly-leaved growth that carpeted the Plains in the old days of the million-headed herd, is reappearing in a new role on airfields of the West, the U. S. Department of Agriculture discloses. Notable for its ability to live and grow even when trampled down day after day by countless heavy hooves, and to withstand practically any extremes in climate, buffalo grass has proved to be an excellent ground cover for fields where bombers bring down their ponderous weight on massive tires. It is also useful on the drill grounds of Western cantonments, where trampling boots grind at it all day long.

Plant breeders of the Agricultural Research Administration, working at Hays, Kans., have developed an especially hardy, tough strain of this species. This has the official designation of 1-i, which naturally has turned into a nickname: "one-eye." Last year's seed "one-eye" crop, amounting to 5,000 pounds, has been distributed partly to military organizations for immediate use, partly to growers for further seed production.

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BOTANY

More Cork Trees

Four thousand cork trees were planted by science enthusiasts during the past year. Seven more mature cork oaks have been located.

➤ MORE THAN 4,000 cork-oak trees were planted by science enthusiasts in the southern states during the past year, it has been reported by the Crown Cork and Seal Company. Leaders in the national effort to help make this country independent in cork, an essential raw material, the company states that seven mature cork oaks, heretofore unrecorded, have been located.

The widespread planting of cork-oak seedlings and search for mature cork oaks resulted from kits containing pieces of natural cork block and cork leaves to help identify the trees, being sent to all of the 4,700 Science Clubs of America located in the southern states and to the more than 5,000 subscribers to THINGS of Science.

Science enthusiasts, interested in raising cork trees and living in states where the trees will grow, may receive cork-oak seedlings or acorns for planting by sending a postcard request, stating the number desired, to the Crown Cork and Seal Company in Baltimore, Md. The seedlings will be sent this fall and winter, at the same time they are furnished those whose requests were received too late last year to be filled.

Thirteen cork oak trees in five states were reported by boys and girls belonging to Science Clubs of America and subscribers to THINGS of Science. Although a few of these trees were already known and one or two had recently been stripped, seven mature cork oaks were located—one in Florida and six in California. The number of mature cork trees growing in the United States is so small that old records are being combed and scouting parties going out in an effort to locate them all.

Cork oaks, from acorns brought to this country long ago, are most likely to be found in states south of the Mason-Dixon line in the eastern half of the country, and west of the Mississippi in Arkansas, Louisiana, Texas, New Mexico, Arizona and California. Cork is the outer bark of an oak closely related to the native live-oak of the South and Southwest.

Those interested in helping search for the oaks should look carefully among old colonial estates and among some of the well-planted expensive homes. Some may well be located in the half-wild stands of trees left around the ruins of old plantation houses and abandoned ranches. Since the cork is not a native tree, it is not likely to be found in the woods.

A cork-oak looks like a live-oak, except that its leaves always have toothed margins, and its acorns are usually much longer and less bluntly pointed. The really critical test, however, is to dig out a small block of the bark. If it is thick and made of pure cork, the tree is undoubtedly a cork-oak and should be reported to the Crown Cork and Seal Company, giving exact location, name of owner, size of tree, and abundance of acorns, if any.

Cork-oaks that are now being planted will yield their first crop of cork bark in from 15 to 20 years. After first stripping, which usually yields low-grade bark, thick shells of cork can be removed from the trunk about every 10 years for a century or more.

Bottle corks are by no means the most important use for cork. Cork blocks are needed for life-belts and fishing-net floats; corkboard for insulation in refrigerators and house walls; cork gaskets for many uses; composition cork for crown cap liners; and finely ground cork for heavy-duty linoleum.

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INVENTION

Coffee Oil Used in Soap As an Aid in Cleansing

➤ THE OIL in coffee beans is utilized in making toilet soap, in a process on which patent 2,353,686 was issued to Robert Brown of New York City. The beans, either green or roasted, are simply ground to an extreme fineness in a matrix of some other good soap-making oil or fat, preferably cocoa butter. Spent coffee grounds, collected from restaurants, can be used as well, the inventor states. The solid fibrous part of the coffee bean, in its finely ground condition, serves as a mechanical aid in cleansing, without being too scratchy.

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***SAVES HUMAN LIVES**—Rabbits, seen in this National Research Corporation of Boston photograph, are being injected with penicillin in tests for its efficiency. Their temperature is observed for four hours after the injection, and if the rise is abnormal, the lot of penicillin is rejected.*

ASTRONOMY

Dr. Shapley Is Awarded Aztec Eagle Decoration

➤ DR. HARLOW SHAPLEY, director of Harvard Observatory, was presented the Order of the Aztec Eagle, third class, highest decoration of the Mexican government awarded to non-Mexicans, at a reception given by Mexican ambassador and Senora de Castillo Najera on Saturday afternoon, July 22.

Instrumental in advancing scientific cooperation between the United States and Mexico, Dr. Shapley has cooperated in placing one of the most advanced astronomical telescopes of today in the National Astrophysical Observatory at Tonanzintla, near Puebla, Mexico.

Honored at the same time with the same decoration as Dr. Shapley was Dr. Alberto Sevilla Sacasa, secretary of the Nicaraguan Embassy at Washington who has lived in Mexico and has promoted cultural relations between his country and Mexico.

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BOTANY

Tomatoes Without Pollen Make Hybridizing Easy

➤ TOMATO PLANTS that produce no pollen, and can therefore bear fruit only when fertilized by pollen from other plants, are reported *(Science, June 30)* by Dr. Charles M. Rick of the University of California College of Agriculture. They are expected to be of use in establishing new, heavy-yielding hybrid varieties.

First hint of the existence of these conveniently pollen-sterile mutant plants was given when one of Dr. Rick's colleagues, Dr. Paul G. Smith, found a tomato plant that persistently bore no tomatoes. Investigation disclosed the fact that its stamens contained no pollen.

Pollen-sterile plants are useful to plant breeders because the customary procedure of pulling out the stamens by hand is slow, tedious and costly. If a natural mutation results in the production of flowers with functional female parts but with the male elements (stamens) either absent or non-functional, this speeds up the breeder's task tremendously. So pollen-sterile plants are always being sought.

What appears to be a side-effect of the inability to produce pollen makes the search for these particular mutant tomato plants easier. Dr. Rick states that they stand out among the normal, pollen-producing plants by their greater vegetative vigor, especially late in the harvest season. Three varieties of tomato were scanned in this manner for male-sterile types in 1943, he says, and the desired pollenless plants were readily found in each variety.

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INVENTION

Ripening of Tobacco Is Speeded by New Process

➤ QUICKER RIPENING of tobacco, with resulting savings in time and tied-up storage space, is claimed on behalf of a controlled-temperature process on which U. S. patent 2,353,718 has been issued to Thomas H. Garber of Richmond, Va. Patent rights have been assigned to Larus and Brother Company, Inc.

In the customary tobacco-ripening process, the bundles of leaf are packed in hogsheads and stored in warehouses. Natural processes produce "sweats"—rises in temperature and moisture content—which bring about the desired mellowing of taste and improvement in smoking qualities. Under natural conditions, these "sweats" occur about twice a year. Tobacco is ordinarily kept in the warehouse from one and one-half to three years.

In Mr. Garber's process, the temperature and moisture are artificially raised at shorter intervals, with each heating-up kept about ten degrees Fahrenheit lower than the preceding one. Steam is the means used for controlling humidity as well as temperature.

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ENGINEERING

Faraday Medal Given to Nobel Prize Winner

➤ THE FARADAY Medal of the Institute of Electrical Engineers, British counterpart of the American Institute of Electrical Engineers, was conferred on Dr. Irving Langmuir, Nobel Prize winner in chemistry in 1932, and associate director of the General Electric Research Laboratory. The medal was presented at the meeting of the AIEE in St. Louis on June 26.

The Faraday medal is given to Dr. Langmuir in recognition of his worldwide services to electric engineering. He is the fourth American to receive the award.

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IN SCIEN

MEDICINE

Dextrin Seen as Aid in Increasing Penicillin

➤ POSSIBILITY of increasing commercial production of penicillin by substituting starch dextrin for lactose in the growth medium is suggested by Dr. Irwin A. Pearl and Dr. John W. Appling, of the Institute of Paper Chemistry.

In a report (*Science*, July 21), they point out that lactose "definitely serves as a preservative for penicillin," whether or not it acts as a nutrient for mold growth. In preliminaary experiments using corn steep liquor, the scientists find that the more plentiful starch dextrin can be substituted for lactose "to give equally high quantities of penicillin."

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CHEMISTRY

Waste From Paper Making Made Useful for Farms

➤ A METHOD of converting waste liquor produced by sulfite process paper mills into a valuable soil amendment has been devised by R. B. Alderfer, soils technologist, and M. F. Gribbins and D. E. Haley, agricultural biochemists, of the Pennsylvania State College. Farmers and fishermen will benefit from this research.

The 27,000,000 tons of waste liquor which annually are poured into the streams of the country constitute a serious pollution problem. This liquor contains 1,500,000 tons of lignin, a major constituent of the original wood used. Lignin, a humus-forming material, is precipitated when added to soils as a result of chemical and biological processes.

This material, after certain constituents harmful to crop growth have been removed, when added to freshly plowed ground, will bring about in the course of time the formation of water-stable granules which render the soil more permeable to air and water. This condition appears to be brought about by the lignin itself or by bacterial action which is induced by this and other constituents of the waste liquor, or by a combination of these factors.

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E FIELDS

FORESTRY

Ancient Sequoia Tree Falls in California Grove

➤ AN ANCIENT sequoia tree, 250 feet high and eight feet in trunk diameter, fell recently in Whitaker's Forest, Tulare County, Woodridge Metcalf, University of California extension forester, reports. When the old tree started to go, it signalled its impending fall with a series of loud cracks like rifleshots, as its tough roots broke. It was the fourth old sequoia to fall in this area since Horace Whitaker deeded the 320-acre tract to the University 34 years ago.

The wood from the fallen giant will be cut up into split fenceposts and grape stakes during the summer. It is expected to yield 4,000 posts and 2,000 stakes.

At the present rate of fall, one tree every seven years, it will be 1,750 years before the last one goes. By that time the present stand of seedlings will have grown up to replace them.

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ICHTHYOLOGY

Teeth Tips Left in Wound Identify Killer as Shark

➤ SHARKS do attack humans. Scientific evidence for this from one fatal case is reported by Capt. B. H. Kean, M.C., A.U.S., (*Journal, American Medical Association,* July 22).

The victim was a young sailor who dived into the Pacific off the north shore of Rey Island, Gulf of Panama, to see whether the ship's propeller had been fouled or damaged. As he came up he was attacked by a "man-eater" shark, six or seven feet long, although no sharks had previously been seen. The shark was seen by the captain and several members of the crew.

Conclusive scientific evidence that it was a shark was obtained through identification of the tips of two shark's teeth found in the victim's leg by the surgeon who repaired the wound. The identification, rare in such cases, was made by John T. Nichols, curator of recent fishes, of the American Museum of Natural History, New York. Dr. C. M. Breder, Jr., curator of the New York Aquarium, concurred in the identification of the teeth tips as coming from a "small so-called man-eater shark, Carcharodon carcharias."

In spite of immediate application of a tourniquet and dressings aboard ship and treatment three hours after the accident at a Naval hospital, the sailor died in shock seven hours after the injury, apparently as a result of blood loss.

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ENTOMOLOGY

Tartar Emetic Effective Against Mexican Fruit Fly

➤ TARTAR EMETIC, nasty, disagreeable drug that used to figure prominently in old-fashioned medicine chests, has been found an effective poison for the Mexican fruit fly by Dr. C. C. Plummer, U. S. Department of Agriculture entomologist working in cooperation with the Mexican Secretaria de Agricultura y Fomento.

Tried out thus far principally under laboratory conditions, the drug has proved most deadly to the flies when given in a sugar-water bait at a concentration of two pounds to 100 gallons of thin sirup. Higher concentrations were not very much more effective. Flies fed (and died) most readily in the forenoon, which is their natural feeding time.

The Mexican fruit fly is not only a pest to fruit crops in Mexico but constantly menaces citrus and other orchards in the southwestern United States. For this reason the U. S. Department of Agriculture constantly maintains a combat mission of scientists in Mexico.

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CHEMISTRY

Small Electric Crucible Is Safe to Handle

➤ A SMALL electric crucible, capable of producing intense heat and yet safe for the chemist or metallurgist to hold in his hand, is covered by patent 2,351,594. The patentees, L. F. Black and C. H. Mellor of Denver, have assigned rights for use to the government, royalty-free.

The cup of the crucible is hollowed out of a solid block of carbon, which serves also as one of the electrodes. The other electrode is a cylinder of carbon that forms the bottom of the cup. A small but powerful high-tension induction coil, with leads through a well-insulated handle, supplies the power.

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PHYSICS

Wilson Cloud Chamber Used To Control Germicide in Air

➤ WHEN AIR-BORNE diseases are controlled by keeping the atmosphere health-conditioned with small amounts of glycol chemicals, non-toxic to man but death to germs, an instrument widely used in the study of atomic particles, the Wilson cloud chamber, will be useful in controlling the amounts of the chemicals to be placed in the room.

The American Physical Society meeting in Berkeley heard two University of California scientists, Dr. C. E. Nielsen, of the department of physics, and K. B. DeOme of the divison of veterinary science, tell how the formation of fog or mist in the chamber can be used to determine the amount of additional chemical needed to make the air antiseptic.

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MEDICINE

Penicillin Promises to Be Effective in Erysipeloid

➤ PROMISE of a new triumph for penicillin with benefits extending to the swine industry later, when supplies of the mold chemical are more plentiful, appears in a report by Dr. F. R. Heilman and Dr. W. E. Herrell of the Mayo Clinic.

Penicillin, their studies show, will probably prove effective in treatment of erysipeloid, a skin disease acquired by infection with the organism of swine erysipelas. In man, erysipeloid is chiefly an occupational disease, affecting those who handle infected carcasses and the like. The disease is usually mild but may at times be serious and debilitating, with painful arthritic symptoms and even blood and heart infection. Swine erysipelas is a major problem of the swine industry.

Immune serum has so far been the only treatment of value for the infection in man. Sulfa drugs have not helped.

In laboratory experiments with mice, the Mayo scientists found that all of 40 untreated mice infected with the swine erysipelas germ died. Among 40 infected mice given penicillin, only two died, a mortality rate of 5% instead of 100%. On the basis of these and test tube experiments, made with the technical assistance of Miss Constance Carter and Miss Nellie Greenburg, the scientists conclude that penicillin should prove effective in treating the disease in man and, if it becomes practical, in swine also.

Science News Letter, July 29, 1944

ASTRONOMY

Meteor Shower

If you wish to sit up late on August 11, you will be rewarded by seeing the Perseids at their maximum. Sky holds bright stars, but planets are close to sun.

By JAMES STOKLEY

➤ ALTHOUGH there are four planets in the August evening sky, they are all so near the sun that they will be hard to see, and none are in a position to be indicated on the accompanying maps, as these show the appearance of the heavens at 11:00 p.m. about Aug. 1 and an hour earlier in the middle of the month.

Venus is the brightest of these planets. On June 26 it passed behind the sun, from west to east, so now it remains in the western sky for a while after the sun has gone down, but it still does not set late enough to be seen easily. However, if you watch the low western sky, as twilight falls, you may be rewarded with a sight of this planet, especially at the end of August.

On the evening of Aug. 19, the narrow crescent of the moon, a little more than a day old, passes Venus, and may help one to find the planet. In another month or two, Venus will have moved far enough east of the sun to be seen readily, and during the autumn it will be the bright evening "star."

Mercury reaches "greatest eastern elongation," when it is farthest east of the sun, on Aug. 10, but it also is well to the south of the sun, and hence this will not be a good time to see it, for even at sunset it will only be about 9 degrees above the horizon, which is a tenth of the distance from horizon to zenith. Jupiter is also nearby, and Venus passes it on Aug. 13. However, the former planet is considerably the fainter, and will hardly be visible.

Mars Is Faint

Higher in the sky, where the moon passes it on the 20th, about 24 hours after it goes by Venus, is Mars, but its brilliance is down to the second magnitude, so it also will be hard to see. Therefore, if you want to see a planet without too much difficulty, you had better stay up late and look to the east a couple of hours before sunrise. Appearing some four hours before the sun is the planet Saturn, the one with the rings. Of the first magnitude, it will be easy to locate. During the coming months Saturn will rise earlier and earlier, and by November will be visible all night.

But though the planets put on a poor show this month, the stars are with us, as always. In the southwest there is the scorpion, Scorpius, with the bright and ruddy Antares. Directly overhead, as shown on the maps, is Vega, in Lyra, the lyre. To the southeast of Vega is another first magnitude star, Altair, in Aquila, the eagle; and to the southwest is Deneb, in Cygnus, the swan. The fifth, and only remaining, first magnitude star that the maps show is Arcturus, in Bootes, the bear driver, directly west and about a third of the way from the horion to the zenith.

This August, as every August, there comes the return of the Perseid shower of meteors, or "falling stars." On any clear dark night, if you watch the sky for a time, you can see a few such meteors, perhaps an average of one or two an hour.

More After Midnight

There are always more after midnight. The reason is that we are then on the forward side of the earth and meet these objects head on, while during evening hours they have to catch up to us.

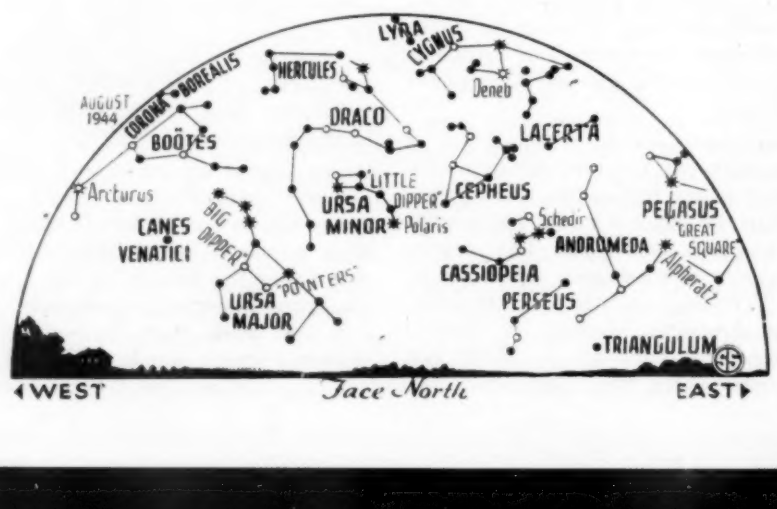
Most meteors are pretty small things, about as big as the head of a pin, or smaller. Entering the earth's atmosphere there is enough friction, even with the rarefied gases 50 miles or more above the surface, to burn them up, and they disappear in a flash of light. Many millions come into the atmosphere daily, and only rarely is there one large enough to survive the encounter with the air, and to reach the ground. Then it is called a meteorite.

In addition to the stray meteors, which are scattered around the solar system, and which the earth is continually picking up, there are several recognized streams of them, each the remains of a comet. As the earth crosses these streams, the number of meteors seen becomes more numerous. Since the meteors of such a stream are moving in parallel paths, the tracks that they make in the sky seem to converge in the distance, like the parallel tracks of a railroad.

Come From Perseus

The constellation toward which these paths seem to point gives the shower its name, and since for the August meteors this is Perseus, these are called the Perseid meteors. Some are seen on nights from about Aug. 9 to 12, but that of Aug. 11 will be about the maximum of the swarm. Some may be seen in the evening, but as mentioned before, they will be more numerous in the early morning hours, when they may appear at the rate of one or two a minute. The moon is at last quarter around this time in August, when it rises about midnight, so its light will interfere to some extent with the meteors, not nearly as much, however, as if it were in the full phase.

Astronomers who make a specialty of studying meteors are always glad to have volunteer help in counting the members of one of these showers. The simplest of such counts is to record the



number visible during half-hourly periods—say from midnight to 12:30, 12:30 to 1:00, and so on. Such records may be sent to Dr. Charles P. Olivier, director of the Flower Observatory of the University of Pennsylvania, which is located at Upper Darby, Pa. He is president of the American Meteor Society and depends largely on amateur observations for his data.

Celestial Time Table for August

Aug.	EWT	
4	8:39 a.m.	Full moon.
5	6:00 p.m.	Moon nearest distance 223,700 miles.
10	10:00 a.m.	Mercury farthest east of sun.
	10:52 p.m.	Moon in last quarter.
11		Perseid meteors.
13	9:00 a.m.	Venus passes Jupiter.
14	4:03 p.m.	Moon passes Saturn.
18	4:25 p.m.	New moon.
19	9:42 a.m.	Moon passes Jupiter.
	11:03 p.m.	Moon passes Venus.
20	2:43 p.m.	Moon passes Mercury.
21	12:27 a.m.	Moon passes Mars.
	2:00 a.m.	Moon farthest, distance 252,500 miles.
26	7:39 p.m.	Moon in first quarter.
31	2:00 a.m.	Jupiter behind sun.

Subtract one hour for CWT, two hours for MWT, and three for PWT.

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MEDICINE

Wounded Are Transferred Just Out of Jap Range

See Front Cover

➤ MODERN METHODS of transferring the wounded insure prompt and efficient attention with minimum amount of discomfort. No longer is it necessary for a wounded man to be transferred in a small, tossing boat.

The casualties of Saipan, shown in the official U. S. Navy photograph on the cover of this SCIENCE NEWS LETTER, are transferred from the destroyer in the background to a larger ship. One wounded man is riding halfway across in his stretcher, while another is being secured to the breeches buoy on the deck of the destroyer.

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CHEMISTRY

Dr. Cope to Receive American Chemical Award

➤ AMERICA'S foremost young chemist of the year is Dr. Arthur C. Cope, 35, associate professor of chemistry in Columbia University. He will be presented in September the $1,000 American Chemical Society award in pure chemistry. His researches on vinyl and allyl chemical types have been of value in the fields of plastics and drugs.

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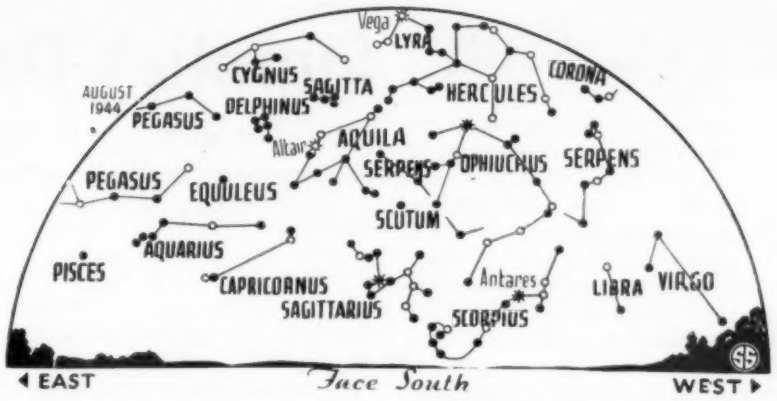

ECONOMICS

Wartime Food Needs Met

Civilian supply involves distribution, conservation, and education as well as production. Nutritional adequacy is the goal.

➤ HOW CIVILIAN wartime food needs are being met by the government was outlined at the Minneapolis meeting of the American Association of Cereal Chemists by R. C. Sherwood of the U. S. War Food Administration. The problem of feeding the civilian population with nutritional adequacy, he said, involves distribution, conservation, and education, as well as production.

To assure proper feeding of civilians in all parts of the country it was necessary, he stated, to determine how much of the many foods eaten is required and how much is available, to promote production when shortages are imminent, and to help direct distribution in the most equitable manner whether the supply is short or in surplus. In addition, the special needs of special groups, he explained, must receive attention. These include industrial war-workers, isolated groups, infants, invalids, hospitalized patients, pregnant and nursing women, and aged persons.

"Providing adequate food for industrial war workers to promote health and maximum efficiency," Mr. Sherwood declared, "is a specially important phase of civilian feeding. However, it is not the sole responsibility of Government; industrial management must recognize its responsibility for the nutrition of its employees. The speaker continued, "When food rationing began it was soon discovered that special treatment was needed for heavy workers in isolated locations, for example, loggers and miners, who are frequently far removed from the source of many unrationed foods."

Equitable distribution of food, he explained, is not synonymous with uniform distribution: "Many of our foods have never been uniformly distributed. Consumption habits vary. Per capita averages of national consumption are very useful figures, but they rarely serve as distribution guides."

Equitable distribution assures that each individual gets his fair share of the nutrients in the Nation's food supply, he added.

Essentiality of usage is the guiding influence, Mr. Sherwood continued: "It has long been the policy of WFA to distribute scarce commodities, insofar as practicable, in the most advantageous manner to encourage consumption of relatively abundant foods."

The present and probable supply of food for the American civilian population, after military needs are taken care of, was reviewed by the speaker.

"Estimates of current food supplies," he said, "show that we can be a fairly well-fed nation, with only minor changes in eating habits, none of which need impair nutrition. The danger of crop failures is always present."

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One-third of the area of the United States is better suited for the growing of *trees* for lumber and new wood derivatives than for other crops.

Do You Know?

China reports the discovery of *petroleum* in western Szechwan province.

The number of early *lambs* in the principal producing states is about 6% smaller this year than last and the smallest number in at least eight years.

Wood furniture manufacturers, previously permitted by wartime order to make only certain types of furniture, now may produce any type they wish.

More than 88,000,000 barrels of crude oil were delivered from Texas to the East Coast last year by the *"Big Inch"* pipeline.

Wartime salvaging of old *rags* is important as they are used not only in making paper but also in asphalt roofing and other war materials.

Ceylon government has established a pilot plant to make acetic acid from *coconut shells,* as the market for coconut-shell charcoal has seriously declined.

Twin kangaroos, the first of which any record is available, were born recently at the Philadelphia Zoo; the mother is caring for one in her pouch, the other is being bottle-fed with cow's milk.

Malayan bull *gaurs,* said to be the toughest, tallest and most "ornery" of all wild cattle, stand over six feet high, have big battering-ram horns, and are coal black in color except for their white lower legs.

Earth colors, called earth pigments or mineral pigments, including the ochers, Siennas, the umbers, the Venetian reds and others, are used in camouflage paints because of their colors and their ability to reflect infra-red rays.

A century ago millions of American *wild buffalo* ranged the west; the great slaughter beginning about 1860 dwindled the number to nearly 500 but through protection in national and other parks there are now over 5,000.

Science and technical advisory committees are assisting the U. S. Alien Property Custodian classify some 45,000 *foreign patents* now invested in the Custodian, to determine those most suitable for small manufacturers.

NUTRITION

Supplies Delivery Slow

Food for our troops in South Pacific takes nine months in reaching its destination. It is better protected now than before, however.

➤ NINE MONTHS frequently elapse between the time supplies leave the assembly line in the United States and are consumed by our troops in the South Pacific Area, Capt. W. W. Bailey of the Quartermaster Subsistence Research and Development Laboratories pointed out at the meeting of the Institute of Food Technologists in Chicago.

A great deal has been done, however, to improve the protection of our foods in the theater of war, he stated, and many of the earlier criticisms and complaints concerning improper packaging and packing no longer hold true.

"I inspected two ration dumps. Each covered about 200 acres or a space about one-half mile square. Supplies are stacked in the open with roads graded between stacks to facilitate loading and unloading," reports Capt. Bailey, who has visited eight island bases in the Pacific Ocean. "This is the important thing we must keep in mind when we think of the storage life of food products in that part of the world."

A case of food products should weigh not more than 50 or 60 pounds, as natives and soldiers can easily handle cases this size all day, he stated. Thousands of cans were ruined by rust in the first shipments, and this rusting will continue to cause problems on unlacquered cans. Canned milk has given more trouble than any other food, but spoilage from chemical and bacterial actions was found to be very small on most canned foods. Wastage of food due to poor vacuum of canned foods is a much more serious problem than is commonly realized, Capt. Bailey reported.

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Paints and Lacquers Best

➤ PAINTS AND lacquers have been found the most satisfactory coating materials for preventing cans from rusting, thus causing considerable loss of essential rations sent to the armed forces, Howard R. Smith, research chemist of the National Canners Association, stated.

Loss of canned foods from exposure to severe weather was great enough to cause the Office of the Quartermaster General to request industry to make a study of the efficiency of various coating materials in preventing rust, Mr. Smith reported. Solid waxes, water emulsion waxes, solvent waxes, petroleum products, paints and lacquers were all tested.

Dipping the cans into the solution was found in certain respects to be a simpler and more economical method of applying the coating than by using a continuous spray, the chemist said. A large-scale coating program designed to protect a canned food packed for overseas has been made possible by these studies.

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Highly Processed Foods

➤ MANY so-called raw foods are as highly processed as are the more obvious "manufactured" products, Horace L. Smith, Jr., of the Chain Belt Company stated at the Institute of Food Technologists meeting in Chicago.

Some fresh fruits pass through six or eight important operations before they reach the grocer. That is food technology just as truly as canning, meat packing, or corn-syrup manufacture, Mr. Smith explained. Good technologists know that it may well be cheaper to keep the vitamin content which we have in the raw material than to buy and add a synthetic component.

"Within the past twenty years there has been a revolution in the supply of fruits and vegetables and some varieties of meat and fish. Mere mention of quick freezing and dehydration is enough to indicate the extent and the importance of such changes. There is every reason to believe that research now in progress and that of the next few years," Mr. Smith predicted, "will give us many more changes quite as fundamental and quite as calamitous for those who do not change."

Food technologists today recognize the many advantages secured by the early elimination of oxygen from food products, and the necessity of maintaining the product in an oxygen-free condition, he stated. Yet only a few years ago "deareation" was a little-known term.

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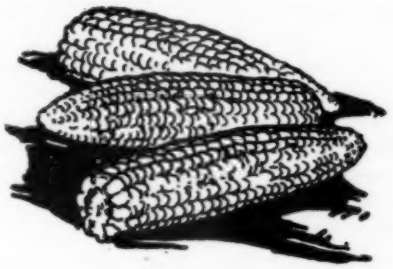
HORTICULTURE

NATURE RAMBLINGS

by Frank Thone



Corn for Christmas

➤ VICTORY GARDENS grow today on fields where victories were won only yesterday, down in the far-flung tropical islands of the Pacific. Soldiers, sailors and marines are growing fresh vegetables to add variety to regulation GI chow. Corn-on-the-cob for Christmas dinner is one item that Sgt. George Doying, USMC, tells about in the U. S. Marines' magazine, *The Leatherneck*.

Many of our armed gardeners are having an experience Americans have not known since their great-grandsires worked their fields with a rifle laid across the plow-handles and a constant eye out for redskins on the edge of the clearing. A considerable number of these front-line Victory Gardens are within gunshot of the enemy, and more are within easy bomber range.

These tropical Victory Gardens are by no means city-lot affairs, according to Sgt. Doying's figures. A total of some 5,000 acres is under cultivation, on islands all the way from New Caledonia to Bougainville. Many of the plots are large enough to require the use of tractors. Total yield this year is expected to exceed 150,000 tons of fresh vegetables, with a value of more than $11,000,000.

Not all the work is done by men of the armed services. A good many natives are hired to tend the strange crops they do not usually care to eat; as incentive for them, a taro patch in one corner is an almost invariable feature of the "farm." Soils in the Melanesian islands are fertile, being either deep black gumbo or fertile volcanic ash, and the perpetual summer climate permits planting at any time and makes growth very rapid. Some of the gardens are being cropped every three months.

In getting gardens of "home" vegetables started in this far, alien region, naturally a number of odd incidents occurred. There is the story of the sergeant who swapped a watermelon (flown in from Hawaii) for a badly needed tractor. And the one about another sergeant in charge of a ton-and-a-half shipment of seeds and tools prioritied off a plane, who "bought" transportation to his destination with the promise of his first batch of cucumbers. And the one about the two crates of green peas that were flown a thousand miles to give a better relish to the Sunday dinner of a lonely island outpost—said crates being made of scraps of mahogany and rosewood lumber.

But perhaps the strangest story of all, and the grimmest, is about the garden that was plowed with bombs. This was at the former Jap base at Vila on Kolombangara, where the enemy's airstrip had been so thoroughly worked over with high explosive that plowing was superfluous. They just gave the ground a good harrowing and then put in the seed.

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MEDICINE

Navy Mental Hospital

Front-line psychiatry has returned 50% of the patients to combat duty, and it is expected an even greater percentage will be cured.

➤ A NAVY HOSPITAL for mental patients in the South Pacific has already returned 50% of the Marine patients to combat duty and the Navy expects to cure an even larger percentage of war neurotics by its new policy of front-line psychiatry, according to a report by a Marine Corps Combat Correspondent, Sgt. George E. McMillan, of Alexandria, Va., released by the Navy Department.

"The Navy is moving psychiatrists into the front lines with Marines," he states.

"One will be assigned to each Marine divisional field hospital, thus completing what the Navy considers a comprehensive program for treatment of war neuroses in the South Pacific.

"The Navy program begins with preventive work in examining recruits, and will not end until the mentally sick Marine returns to his home cured and ready to resume his normal civilian pursuits.

"Psychiatrists are stationed in all Navy base and mobile hospitals, and one hospital in the South Pacific has been set aside for the particular treatment of mental cases. It is situated outside the combat area in a city where peaceful civilian activities are carried on, where the climate is temperate, and where there are ample recreational opportunities.

"Necessary orders for assignment of psychiatrists to Marine units were issued recently by Capt. F. R. Hook (MC), USN, Admiral Halsey's Force Medical Officer, and the work will be carried on under the general direction of Capt. A. A. Marsteller (MC), USN, commanding officer of the hospital where most mental patients are sent.

"Front-line treatment, experience has shown, is especially effective in cases of anxiety neuroses.

"English doctors who used the method during the heavy bombing of London and after Dunkirk, estimate that as high as 70% of war neurotics can be cured if treated immediately.

"Anxiety neuroses are cases most easily treated, as distinguished from chronic neuroses, which are likely to be of greater duration.

"Examples of anxiety neuroses are symptoms doctors call mutism, amnesia, and hysterical paralysis, among others.

"Here is a story of mutism. A Marine and his buddy fought for days through swamps, and slept in water-filled foxholes. One morning the Marine looked up to see a Jap taking aim at his buddy. The Marine took aim at the Jap. His gun jammed. The Jap killed his buddy. The Marine was struck dumb.

"'That is understandable to anyone,' Captain Marsteller says. 'And it is just such cases as this that lend themselves to immediate skilful psychiatric treatment.'

"With such success, Captain Marsteller points out, that the man is not only able to talk again, but is able and eager to return to combat.

"Success depends upon three factors: 1. Immediate treatment. 2. That the men are not evacuated to base hospitals. 3. The skill, experience, the insight of the psychiatrist.

"The doctors chosen for this work have had years of psychiatric experience in civilian life, have worked with war neurotics, and have undergone indoctrination in Captain Marsteller's institution.

"'Nothing succeeds in psychiatry of this kind,' Captain Marsteller adds, 'as much as the good old-fashioned qualities of common sense and sympathy. We are not going to send any doctors into combat who do not have an abundance of both.'"

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INVENTION

Machine Squeezes Oranges And Eliminates Peel Oil

➤ A MACHINE for squeezing juice out of oranges, grapefruit and other citrus fruits, without getting too much of the sharp-tasting peel oil into it, is covered by patent 2,353,841, granted to Ronald B. McKinnis of Winter Haven, Florida.

The round fruits are dropped into the machine in such a way that they are cut in two by sharp knives, and each half fitted automatically into a hemispherical depression in a revolving roller. The small amount of juice released by the cutting carries off the peel oil. Then the half-fruits in their cups are pressed against hemispherical projections carried on an opposing cylinder, and the juice is thus squeezed out. This part of the process is carried on in an atmosphere of neutral gas, without oxygen, to reduce deterioration of vitamins.

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• First Glances at New Books •

➤ A "MUST" BOOK for all biologists is Franz Schrader's MITOSIS. All known facts about this basic life phenomenon, together with all present-day efforts at interpretation, are summarized in only 86 pages of text—a masterly job of condensing and packing, with all statements tightly documented. For those who want to go into some phase more extensively, the additional 18 pages of literature citations furnish an adequate bibliography. (*Columbia Univ. Press*, $2.)

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➤ CHEMICAL MACHINERY, by Emil Raymond Riegel, is an interesting elementary treatise of machinery, apparatus and devices used in the chemical industries. It is non-technical. (*Reinhold*, $5).

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➤ STUDENTS of both chemistry and scientific agriculture have reason to welcome A SOURCE BOOK OF AGRICULTURAL CHEMISTRY, by Charles A. Browne (*Chronica Botanica Co.*, $5). Dr. Browne has done a most scholarly piece of work, in selecting excerpts from the really significant writings about the chemistry of the soil and the plants that grow therein, all the way from the Greeks to Liebig. His penetrating comments carry this work beyond the ordinary scope of a source book: they show how the science grew and evolved, each master preparing the soil in which his successors might find root for their newer knowledge.

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➤ VICTORY Gardeners will find Louis Pyenson's PEST CONTROL IN THE HOME GARDEN a field manual well adapted for the kind of defensive warfare they have to wage. It tells, in compact text and clear illustrations, the pertinent facts about the principal garden pests, describes weapons and munitions, and gives directions for using them. (*Macmillan*, $2.)

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➤ PLANT PHYSIOLOGISTS, whether their outlook be strictly of the laboratory or of application in agronomy, will find much good meat in LECTURES ON THE INORGANIC NUTRITION OF PLANTS, by D. R. Hoagland, first of a new series of plant science books edited by Frans Verdoorn (*Chronica Botanica Co.*, $4). Not professing to be completely exhaustive, this group of essays nevertheless gives the main outlines of modern knowledge in its field in most satisfying fashion, and includes a great deal that has not yet found its way into even the later editions of standard texts.

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• Just Off the Press •

THE FIGHT AT PEARL HARBOR—Blake Clark—*Infantry Journal*, 104 p., paper, 25 cents. Fighting Forces Series, June 1944.

GAS WARFARE: Smoke, Flame and Gas in Modern War—Alden H. Waitt—*Infantry Journal*, 228 p., papers, 25 cents. Fighting Forces Series, June 1944.

GERMAN DICTIONARY FOR THE SOLDIER—Henius—*Infantry Journal*, 239 p., paper, 50 cents. Fighting Forces Series, June 1944.

THE MYCETOZOA OF NORTH AMERICA: Based upon the Specimans in the Herbarium of the New York Botanical Garden—Robert Hagelstein—*Hagelstein*, 326 p., illus.

THE NAZI STATE—William Ebenstein—*Infantry Journal*, 335 p., paper, 25 cents. Fighting Forces Series.

NOR DEATH DISMAY: A Record of Merchant Ships and Merchant Mariners in Time of War—Samuel Duff McCoy—*Macmillan*, 248 p., $2.50.

OUR ENEMY JAPAN—Wilfrid Fleisher—*Infantry Journal*, 179 p., paper, 25 cents. Fighting Forces Series, June 1944.

THE RUSSIAN ARMY: Its Men, Its Leaders and Its Battles—Walter Kerr—*Infantry Journal*, 186 p. paper, 25 cents. Fighting Forces Series, June 1944.

A SHORT HISTORY OF THE ARMY AND NAVY—Fletcher Pratt—*Infantry Journal*, 262 p., paper, 25 cents. Fighting Forces-Penguin Special.

SO YOU'RE GOING OVERSEAS!—S. T. Barker—*Infantry Journal*, 118 p., paper, 25 cents. Fighting Forces Series, June 1944.

TECHNIC OF ELECTROTHERAPY and its Physical and Physiological Basis—Stafford L. Osborne and Harold J. Holmquest—*Thomas, C. C.*, 780 p., illus., $7.50.

TRAINS, TRACKS AND TRAVEL—T. W. Van Metre—*Simmons-Boardman*, 417 p., illus., $3.50. Sixth ed.

THE TRUTH ABOUT DE GAULLE—Andre Riveloup—*Arco*, 80 p., paper, $1.

WAR BACKGROUND STUDIES—*Smithsonian Institution*—Nos. 2, 3, 5, 8, 12 and 17, 10 cents per copy, all others 25 cents. Price Change.

THE WAR IN OUTLINE 1939-1944: Materials for the Use of Army Orientation Course—War Dept.—*Infantry Journal*, 228 p., paper, 25c. Fighting Forces Series, June 1944.

THE WOODS HOLE MARINE BIOLOGICAL LARORATORY—Frank R. Lillie—*Univ. of Chicago Press*, 284 p., illus.. $4.

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NUTRITION

C. O. Guinea Pigs

➤ CONSCIENTIOUS objectors recruited from camps all over the country have volunteered their services as human guinea pigs for experiments to test the energy value of food rations issued to soldiers at the fighting fronts, it was disclosed by Dr. Ancel B. Keys, professor of physiology at the University of Minnesota, at a dinner given by the Sugar Research Foundation.

Dr. Keys was one of six recipients of grants totaling $104,000, announced tonight by the Foundation for further studies on sugar.

By using 24 conscientious objectors, as well as students, hospital patients, and soldiers for his experiments, Dr. Keys expects to find the answers to such problems as how much thiamin and other vitamins we need, and how sugar influences our requirements for them.

The volunteers live in laboratory dormitories where the temperature can be adjusted to tropic heat or arctic cold, from 30 degrees below to 130 degrees above zero Fahrenheit. The air is sometimes so humid that it practically rains, and clothes and bedding are damp. The humidities range from 10% to 95%.

"The subject," reported Dr. Keys, "takes all his meals in the laboratory dining-room where the food is all prepared in an adjoining kitchen. Every portion is weighed and an exactly similar one is quick-frozen and preserved for exact analysis in the chemical laboratory. . . . In this way the staff scientists know exactly what goes into each subject.

To determine the energy value of the food they eat, the subjects spend a certain number of hours each day on motor-driven treadmills, and a record is kept of the amount of work done and the calories expended.

Other tests include an analysis of the air breathed out by the subject, analysis of blood samples taken from his arm, and a record of his pulse rate. These tests give the scientists a picture of each man's ability to do work and susceptibility to fatigue.

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•New Machines and Gadgets•

❁ *AUTOMOBILE horns, with devices to control the intensity, emit a low warning sound in quiet neighborhoods and a loud sound when traveling at high speeds. A wind-driven generator, whose speed varies with the air intake, and a microphone sensitive to the intensity of the surrounding noises, form the basis of the device.*

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❁ *MOISTURE TELLER, to determine the moisture content of granular, fibrous and crystalline substances, is a laboratory instrument designed to replace the drying oven. In it moderately heated air is forced through the weighed sample on a sample pan, drying it rapidly and uniformly.*

Science News Letter, July 29, 1944

❁ *MONOGOGGLES, which differ from ordinary factory goggles by having only one window, are made of clear transparent plastic pieces that extend across both eyes. The lens or window fits into a frame also of transparent plastic.*

Science News Letter, July 29, 1944

❁ *MAGNETIC compass used in American fighting tanks and armored vehicles, shown in the illustration, utilizes 58 plastic pieces to replace parts formerly made of brass, bronze and aluminum. Humidity, temperature, and vibration requirements are met. Cobalt magnets are used.*

Science News Letter, July 29, 1944

❁ *SIGHT DEVICE for archery bows is a small tube attached rigidly to the bow above and parallel to the arrow by means of a flat plate. The plate is held by clamp screws with pointed ends. The sight may be adjusted either vertically or horizontally.*

Science News Letter, July 29, 1944

❁ *RADIO and other electrical equipment are sealed against harmful moisture by a new plastic called Fosterite that flows like water to fill every tiny space in the windings and coils. Electrical instruments treated with this material are uninjured, even if submerged in water.*

Science News Letter, July 29, 1944

❁ *PORTABLE signaling device to warn the hard-of-hearing when visitors approach, contains an electric bulb and battery in one housing and a push button device in another, the two being connected by electric wires. The housings are stuck with rubber suction cups on the two sides of the door, with the wires running around the edge.*

Science News Letter, July 29, 1944

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 218.*

Question Box

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INVENTION

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